

Published in final edited form as:

*Emotion*. 2010 August ; 10(4): 511–518. doi:10.1037/a0018723.

## Becoming a better person: temporal remoteness biases autobiographical memories for moral events

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### Abstract

Our autobiographical self depends on the differential recollection of our personal past, notably including memories of morally laden events. While both emotion and temporal recency are well known to influence memory, very little is known about how we remember moral events, and in particular about the distribution in time of memories for events that were blameworthy or praiseworthy. To investigate this issue in detail, we collected a novel database of 758 confidential, autobiographical narratives for personal moral events from 100 well-characterized healthy adults. Negatively valenced moral memories were significantly more remote than positively valenced memories, both as measured by the valence of the cue word that evoked the memory as well as by the content of the memory itself. The effect was independent of chronological age, ethnicity, gender, or personality, arguing for a general emotional bias in how we construct our moral autobiography.

### INTRODUCTION

An essential dimension of how we think of people is normative: some are good, others bad, some should be praised, others punished. Moral judgment pervades not only how we think of others, but also how we view ourselves, and it appears plausible that a large proportion of the memories that matter the most to us personally are morally laden. Curiously, despite great interest both in moral cognition (Greene & Haidt, 2002; Haidt, 2007; Moll, Zahn, de Oliveira-Souza, Krueger, & Grafman, 2005) and in autobiographical memory (Berntsen & Rubin, 2002; Rubin & Schulkind, 1997; Schacter, 1996), memories for moral events have received scant investigation. Part of the reason for this neglect is no doubt the effort required to collect such memories in the first place; another may be the presumption that moral memories are no different from other emotional memories.

A large literature has demonstrated that our recollections of past events can be, and indeed easily are, distorted (Schacter & Slotnick, 2004; Loftus & Ketcham, 1994). Emotional memories are typically more vivid, recollected more readily and with a stronger sense of familiarity, even though they are not necessarily more accurate in their details (Christianson & Loftus, 1991; Heuer & Reisberg, 1990; Winograd & Neisser, 1992). Studies of so-called “flashbulb memories” have probed the possible effects of emotion on memory in events such as the 9/11 attacks on the World Trade Center (Talarico & Rubin, 2003) or the

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explosion of the Challenger space shuttle (Neisser & Harsch, 1992). The findings have been mixed. On the one hand, there is evidence that highly emotional events in real life are remembered analogously to those in laboratory experiments, demonstrating that emotional arousal enhances memory encoding and consolidation (McGaugh, 2004; Phelps, 2006). On the other hand, it has become clear that at least some flashbulb memories are not at all accurate and that strongly emotional events might lead more to increased conviction and vividness on the part of the participants than accurate correspondence to the facts (Talarico & Rubin, 2003). It may be that flashbulb memories occur under such highly emotionally arousing circumstances that they are not analogous to milder emotional memories in this regard.

The debates regarding flashbulb memories notwithstanding, one might expect that moral memory would involve mechanisms and effects similar to those that come into play for emotional memory in general. In particular, given that moral events are typically judged to be emotional and that their perception involves some of the same brain structures that are also involved in the emotional modulation of memory (Moll et al., 2005), one would expect moral memories to predominate in our autobiography and to be recollected with especially vivid detail and accompanying reliving of some of the emotion. On the other hand, just as emotionally highly salient memories can be distorted (Loftus, 1993; Schacter & Slotnick, 2004), so could moral memories.

A few studies bear out these initial predictions. For example, the extent to which moral blame is assigned to an act influences its memorability (Pizzaro, Laney, Morris & Loftus, 2006) and a person's stage of moral development influences how women recollect their decisions surrounding the termination of an unwanted pregnancy (Blackburne-Stover et al., 1982). Taken together, the studies suggest an important mechanism whereby our autobiographical self develops throughout the lifespan. Rather than being a simple accrual of laid down memory traces, our autobiography is better viewed as an active construction (Barsalou, 1988; Conway & Pleydell-Pearce, 2000) perhaps mechanistically not too different from simulations of our anticipated future (Schacter & Addis, 2007) and one that is significantly shaped by those episodes in our lives that concern us the most emotionally and morally.

Here we investigated one broad aspect of memory reconstruction: how the valence of moral autobiographical events influences our memory for them. We collected a unique database of over 700 autobiographical moral memories and characterized this material in terms of temporal remoteness and emotional valence. In addition, we probed possible contributing factors through an extensive assessment of all participants. The results argue for a strong effect of temporal remoteness on the valence of recollected moral memories, independently of any other factors: we remember our best deeds as the most recent ones, and our worst deeds as the most remote ones.

## METHOD

Complete details of this study are described in Escobedo (2008); the full set of ratings on questionnaires is given also the Supplemental Online Materials accompanying this article.

### Participants

We recruited 100 healthy adults from the Los Angeles community through an online job posting website (craigslist.com), a selected participants between the ages of 40–60 (mean =  $48.9 \pm 5.9$  years), with equal gender distribution and with a racial composition matching that of the state of California (Table 1). All participants were screened for coherence and fluency in their English language skills, although they were not required to be native English

speakers. All were required to have been residents of Southern California for the past 15 years or more and we excluded any with a history of neurological or psychiatric disease. Participants gave informed consent and received written assurance of anonymity regarding their data. Demographic information was collected about each participant through a series of pencil-and-paper questionnaires. The population demographics of our final group matched the California census averages on IQ (mean = 110), gender distribution, and ethnicity. Our sample also included the expected proportion of right- and left-handed people and varied in occupation, sexual orientation, political, religious and cultural backgrounds. Overall, our sample provided a highly representative sampling of the general, healthy, English-speaking population in Southern California within the ages of 40–60 years old.

## Procedure

Participants were tested on 2 separate days, spaced several weeks apart (mean =  $71.7 \pm 37.8$  days, range = 181 days). In the first visit, we collected background data and memories; in the second visit, participants rated the moral memories they had produced during the first. During the first testing session, a battery of questionnaires was administered to collect background information and generate neuropsychological profiles of the participants. (A subsample of these findings can be seen in Table 1.) After these assessments, a cued memory recall task was administered to collect moral memories.

To elicit autobiographical memories of morally laden events, we designed a cue-elicitation protocol similar to that used in previous memory research (Crovitz & Schiffman, 1974; Rubin & Schulkind, 1997). Participants were seated in a room by themselves in front of a computer that recorded their spoken memories for later transcription. The setting was comfortable and private and participants were assured that their recollections would be confidential. The computer-administered task began by asking participants to recall a memorable life experience. Participants were instructed to try to make each memory approximately 3 minutes in length and a countdown timer was provided for their reference. After completing their first recollection, participants were asked to recall an additional 4 memorable life experiences. These recollections served to familiarize the participants with the equipment and the timing and provided them the opportunity to request help from the researchers before beginning the experimental portion of the task. We chose 30 cue words to prompt moral recollection, spanning both positive and negative affect, and comprised of three broad categories: words denoting emotions, actions, or superlatives (see Table 2). Each cue word appeared on the screen in a specific question (e.g., “Please talk about a time when you did something that made you feel GUILTY”) and participants were instructed to recount a specific, personal, autobiographical event related to that question. It is important to note that at no point were participants informed that this task was specifically about *moral* memories. Many participants became emotional during the narration of their memories and were encouraged to take breaks as needed. Participants spent approximately four hours (including breaks) completing the task. Participants filled out an exit questionnaire about their experience at the end of the session to assess the emotions they experienced during the task.

To estimate the incidence of confabulated memories, we contacted 44 of the original 100 participants over the phone, two years after data collection. These participants were told that we were doing a follow-up to the original experiment about honesty and were explicitly asked if they had produced completely truthful narratives, to the best of their knowledge. In addition to collecting these self-reports of honesty, participants were asked if they would be willing to speak to an assistant anonymously about the memories they had produced. 11 participants participated in this second testing session. The research assistant prompted the participant to re-tell a memory by providing a short sentence about the original memory (e.g., “You told a story about returning a lost wallet. Can you tell me about that?”). Each

participant was asked to recall three memories and the assistant rated each recollection's similarity to the original memory.

### Cue Word Selection

Eighty-eight words pertaining to morality were generated as potential cue words during a brainstorming session among several researchers. Initial examination revealed that these words fell into two major categories: words that described moral feelings and words that described moral actions. Since both feelings and actions are important triggers for recollection, the decision was made to split the cued recall task into two sections (with 10 cues each). A third category was added to help participants recollect the very best and worst moral events in their lives. This 'superlatives' category contained 6 cues. Four control words (2 emotions, 2 actions) were added to the sets to use for comparison. Kucera-Francis word frequencies (Kucera, H., & Francis, W. N., 1967) and the Affective Norms for English Words (ANEW) (Bradley, M. M., & Lang, P. J., 1999) were used to select a final set of cue words that were balanced by emotional valence and frequent in common English. (Table 2 shows the final cue words.) The final set of cue words was also checked for outliers in word length (mean =  $7.95 \pm 2.37$ , range = 4–13 letters) and written frequency (mean =  $21.35 \pm 23.14$ , range = 1–71).

### Data Transcription

The memories were manually transcribed from the original recordings by research assistants who were blind to the identity of the participants. They were made anonymous by replacing names and other information in the narrative that could serve to identify individuals. Care was taken when replacing identifying data (names, locations) to retain the character of the identifier (e.g. age and gender associated with the name). The transcribed memories were edited for grammar, coherence and readability, but vernacular and agrammatical figures of speech were maintained as much as possible, to allow the memories to retain the participant's style of recounting.

### Moral Memory Selection

From a total of 3300 memories produced by the 100 subjects, we identified 758 as autobiographical moral memories. Our criteria for this selection were that the memories needed to be: 1. episodic and personal (specific, datable events), 2. moral and 3. involve a decision or choice (resulting in an intentional action or omission of an action). Events that were not recounted in the first person were excluded, as were events that were generic or overly vague. The moral status of the memory required agreement by two independent raters on at least one of two key criteria: (1) objective harm or prevention of harm, or (2) feelings of right or wrong associated with the event described by the memory. In subsequent discussions with a number of psychologists and philosophers involving several examples of the moral memories collected, there was no disagreement on the criteria used. Our intent was to select as broad a class of moral events, by any definition, as possible.

### Memory Ratings

For the second visit, participants were given transcripts of the moral memories they had narrated on the first visit and were asked to date them and rate them on multiple dimensions. Participants were still blind to the 'moral' testing parameter although it usually became clear during this testing session. A 52 item, computer-administered questionnaire was used to elicit information about several factors: general background information about the action in the memory, the emotions the participant felt about their behavior in the memory, and moral judgments about their behavior in the memory. The moral judgments were subdivided; we asked participants to rate and explain their behavior at the time the memory occurred, their

perceptions of their actions now as they look back on the memory, their beliefs about how others would view their actions, and general questions about how ethical they believed themselves to be. These questions were repeated for each moral memory that the participant had generated. (See Supplementary Materials for the full questionnaire).

Memory transcripts were also rated by an independent group of 55 adult raters, none of whom had participated in the main experiment. Raters judged the actions in the narrative (26 attributes), the narrator's reasons for the actions (18 attributes), and the narrator's feelings about the actions (12 attributes; see Supplementary Materials for the full list; the ones we analyzed here are denoted by asterisks). Here we analyze ratings of six of these questions: whether each memory involved helping/hurting someone, doing the right/wrong thing, feelings of personal moral strength/weakness. These six features were selected for analysis because they establish strong valence dichotomies in each pair.

## RESULTS

As Table 1 bears out, all our participants were healthy and representative adults. Participants all treated the experiment quite seriously; several were in tears after recounting their memories and generally endorsed ratings on the exit questionnaire that indicated a high level of emotional involvement (on a 1–10 rating for the question, “How emotional did you feel during this study?”; mean =  $7.16 \pm 1.89$ ). Our follow-up phone study assured us that there was little or no confabulation, since all of the 44 subjects we contacted strongly indicated they had provided honest accounts and since the 11 subjects whose memories we probed for reliability all produced narratives that matched their original memories.

### Memory Remoteness influences Valence of Cue Words

Simply rank-ordering cue words according to the mean age of the memories they had produced (Figure 1A) suggested a pattern whereby more remote memories were associated with more negative cue words. As a further initial exploration, we examined memories elicited by the cue ‘memorable’, by grouping them into those rated positive versus those rated negative, using ratings from three independent raters. The mean age of the positive memorable events fell nearly 8 years earlier than that of the negative memorable events (Figure 1A). However, given the small number of items in each group ( $n = 8$ ), this difference did not achieve statistical significance ( $t[14] = 1.16$ ,  $p = 0.26$ ).

We next plotted memory remoteness against the rated valence of the cue word (Figure 1B). Here we found a significant relationship: the mean age of memories produced by cues with a positive valence was less than that of memories produced by cues with a negative valence ( $t[25] = 3.95$ ,  $p < 0.001$ ). Similarly, there was a significant positive regression of cue-word valence on age of memory ( $R(26) = 0.74$ ,  $p = 0.004$ ). Given our relatively narrow age range (40–60), we thought it likely that this effect would also be obtained if absolute chronological age at the time of the memory event were used, rather than remoteness. Indeed, we found that there was little difference in the distributions between absolute age of the subject at the time of the memory and the age of memory, and the above association with cue-word valence held. The association also held when we split participants into the youngest and oldest fifty, demonstrating that the participant's age at the time of the memory, and/or memory remoteness were driving the effect.

### Memory remoteness influences valence of the memory

We next examined the recollected narratives themselves. We began with an automated text analysis using the Linguistic Inquiry and Word Count database (Pennebaker, Chung, Ireland, Gonzales, & Booth, 2007), which counts the number of words in a sequence of text

in terms of their frequency in various categories. We examined positive and negative emotion categories. While there was a small effect of the word count of emotionally valenced words as a function of memory remoteness ( $R(498) = 0.26$ ,  $p = 0.14$ ), this was not anywhere near statistically significant, a null finding that is perhaps not surprising given that the emotional semantic content of the narrative is likely only weakly related to mere frequencies of emotion words within it.

We found a clearer effect when the memories were categorized by the 55 independent raters; here we focused on three pairs of categories that had clear opposites: moral weakness versus strength, doing the right thing versus the wrong thing, and hurting someone versus helping someone (Figure 2). Each of these pairs showed a significant difference with respect to the mean age of the memories ( $t[972] = 5.44$ ,  $p < 0.001$ ;  $t[1192] = 8.68$ ,  $p < 0.001$ ; and  $t[958] = 7.95$ ,  $p < 0.001$ , respectively). When the means of the three negative categories were contrasted with the means of the three positive categories, a significant difference was also found ( $t[4] = 9.21$ ,  $p < 0.001$ ).

### Possible covariates

To probe for possible factors that could influence the above effects, we examined a large number of possible covariates, including age, gender, IQ, mood, ethnicity, religion, political affiliation, and personality (Table 1). None of these effects had a significant effect on the pattern of findings, arguing that the above results hold across a wide range of individuals.

### Passive forgetting versus active repression

One could hypothesize a number of effects driving the above findings. Perhaps negatively valenced moral memories were more emotionally arousing, and hence less susceptible to forgetting over time, accounting for their disproportionate representation in remote epochs. A different possibility might be that subjects actively reconstructed their autobiography so as to render their most recent acts in the most favorable light and relegate bad deeds to the distant past. As an initial exploration of these possibilities, we further examined the ratings collected from the participants during their second testing session. We used ratings of intensity and emotionality as measures of the arousal of each narrative and ratings of reflection upon self as measures of impact on self-image<sup>1</sup>. Linear regression of each of these variables showed no significant effect of arousal on the remoteness of the narrative (Intensity  $R(733) = 0.065$ ,  $p = 0.91$ ; Emotionality  $R(733) = 0.07$ ,  $p = 0.89$ ), but a significant effect of self-image on remoteness (Reflection on Self  $R(733) = 0.30$ ,  $p = 0.016$ ; General Reflection  $R(733) = 0.30$ ,  $p = 0.015$ ).

## DISCUSSION

We collected and analyzed a large and rich set of data to investigate the temporal distribution of moral autobiographical memories. We found that memories of more positive moral events, on average, corresponded to more recent events than did memories of more negative moral events. While the effect also held for chronological age of the memory as such, this may be simply a result of our compressed age range of participants rather than an alternative explanation; the fact that the effect held for people in their forties as well as for people in their fifties argues that remoteness of the memory as such may be most responsible. The effect was not modulated by gender, IQ, mood, ethnicity, or personality.

<sup>1</sup>Participants answered the following questions: "How intense was this experience?" (1 = not intense at all, 10 = extremely intense); "How emotional was this experience for you?" (1 = not emotional at all, 10 = extremely emotional); "How well does this story reflect your general behavior?" (1 = I never act like this, 10 = I always act like this); "How well does this story reflect on you?" (1 = It reflects very badly on me, 10 = It reflects very well on me).



The findings suggest that there is a general bias in how we construct our autobiographical past, with a tendency to remember the most recent events as those that are also the most morally positive.

It is surprising that there were no effects due to gender, personality, or any of the other factors we examined, since one might have expected there to be such a relationship. In particular, we had expected associations between personality traits and the magnitude of our memory bias and also gender effects. However, these may be evident in more detailed analyses of the style and material recalled, such as distinctions between gist and detail that have been reported for gender effects (Cahill, 2005), a topic for future analyses. Working against obtaining such a finding in the present study was the comprehensive assessment of subjects and exclusion of any with a history of psychiatric illness, including mood or personality disorders.

One initial reaction to our findings might be to focus on the age of the participants rather than the age of the memories, and to situate the results in light of socioemotional selectivity theory (Carstensen, 1995). This framework is supported by a large literature showing that older people focus more on maintaining positive emotions than do younger people, an effect that appears to be parametric across the lifespan (Charles et al., 2001) and that influences many aspects of cognition including memory (Kennedy et al., 2004). While the restricted age range of our sample (40–60 years) would not be expected to result in a large positivity effect due to aging, we checked whether the effect we reported held regardless of the age of our participants. We found that it did; the results look the same whether from people in their 40s or their 50s. It is also interesting to consider a recent study (Fernandez et al., 2008) that suggests at least one contribution to the positivity effect on memory in older people may result specifically from an increase in positively-valenced confabulations, rather than in differential recall of veridical memories alone. Relatedly, older people may experience a stronger feeling of familiarity for positively-valenced material in recognition memory tasks (Spaniol et al., 2008). While we have neither a young comparison group in our study nor a definitive measure of memory accuracy, the middle-age range and lack of any evident effect of age in our sample, together with the ability of participants reliably to re-tell their previously produced memories, leads us to suspect that our findings result from a real effect of the remoteness of the memory per se.

However, there is another explanation important to consider: the age of the participants not at the time of testing, but at the time that the memory occurred. As we reported here, our data are compatible also with an effect of the age of a person at the time of the memory event, as well as with remoteness (since the two are highly correlated in our sample). It is therefore a distinct possibility that a large class of morally negative events are overrepresented in younger people -- perhaps because of their circumstances and lifestyle, and/or the way that they experience events. Young people's moral actions may not need to be intrinsically more negatively valenced than those of older people, but their experience of them could be. Future work will be required to disentangle this possibility from the one we favor, a genuine memory bias, explanation of which we turn to next.

Our findings can be generally related to several theories in social psychology that aim to account for how we access, use, and possibly distort information about ourselves in the service of creating a positive and resilient self-image. Perhaps most salient here is temporal self-appraisal theory (Wilson & Ross, 2001). This line of work begins with the observation that we not only compare ourselves to others around us, but we also compare ourselves to how we were in the past or might be in the future-- indeed, we might engage in such cross-temporal self comparisons more often than we make comparisons with other people (Wilson & Ross, 2000). One effect found in this line of research is that people tend to ignore,

discount or otherwise distance themselves from past failures with the result of enhancing a sense of self-improvement over time (Ross & Wilson, 2002). These findings from temporal self-appraisal theory could also be combined with theories about how we judge similarity or contrast to our present self-image. For instance, Mussweiler's (2003) Selective Accessibility Model argues that in cases where similarity is primed, assimilation judgments are made, whereas in cases where dissimilarity is primed, contrast judgments are made. Putting these threads together would yield the following hypothetical mechanism: when participants are asked to recollect memories from cue words they feel are not representative of who they are, they will tend to maximize the temporal distance of the memory in an effort to distance their current self from the past self. Or conversely, when participants recollect events from their remote past, they will tend to recollect events that they would judge to be emotionally most dissimilar from their current self.

This idea could be further tested in a number of ways in future studies. One important extension would be to characterize in more detail, or experimentally manipulate, participants' current mood. We did measure personality as well as mood (cf. Table 1) but found no interaction with these factors; however, this may well have been because we had a relatively narrow range on these factors due to our selection criteria, which excluded individuals with mood or personality disorders that would have produced a psychiatric diagnosis. Another interesting line of future work could explicitly manipulate participants' current personality focus at the time of recollection (Hanko, Crusius, & Mussweiler, 2009), or measure participants' self-esteem (Mussweiler, Gabriel & Bodenhausen, 2000). A focus on positive valence or on praiseworthy moral acts, together with low self-esteem of the participant, might all argue drive an increase in temporal remoteness for negatively-valenced memories of moral events like we observed.

Given our focus on moral memories, rather than emotional memory more generally, we also considered our findings in relation to construal-level theory (Trope and Liberman, 2003), which would argue that moral events are viewed increasingly in terms of moral principles (rather than in terms of specific context and circumstance) the more remote they are (Eyal, Liberman & Trope, 2008). "Remoteness" in construal-level theory is operationalized as either temporal remoteness or psychological remoteness more generally, and the overall effect in the cited study (Eyal et al., 2008) was to increase the judged blameworthiness and praiseworthiness of moral actions with increasing remoteness. Consistent with construal-level theory, we had found that increasing memory remoteness was associated with increased judgments that the memory reflected accurately on the kind of person one is-- just the abstract, principle-driven perspective predicted by construal-level theory. But, in our study, why would negative moral events be associated with these dimensions, rather than positive ones? One possibility may well be the highly personal nature of the memories. Participants in our study were not asked to consider hypothetical events, and the confidential, anonymous nature of the memories we collected may thus have resulted in a style of retrieval more akin to a confession than a justification. Returning to the other theoretical frameworks we noted earlier-- temporal self-appraisal theory and the selective accessibility model -- would provide mechanisms for the specific valence effect we observed. We thus favor the interpretation that people honestly view their past in a morally critical light, but that at the same time they tend to emphasize that they have been improving: we may sometimes be bad, but are becoming better people with time.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.



## Acknowledgments

We thank Jessica Stockburger for help in collecting and selecting the memories, Jessica Levine for help with data entry, and Tony Buchanan for help with pilot analyses.

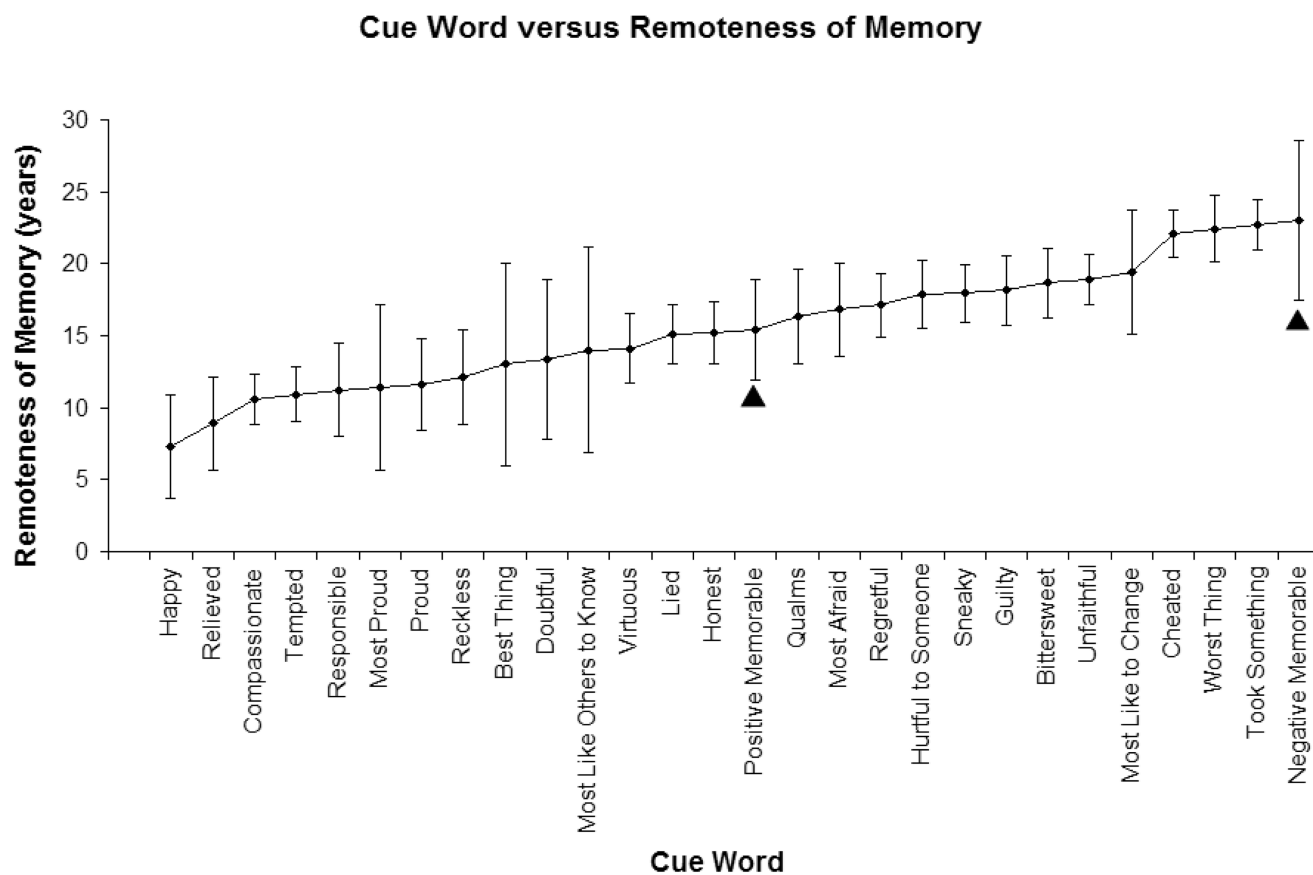
Supported by a grant from NIMH to R.A.

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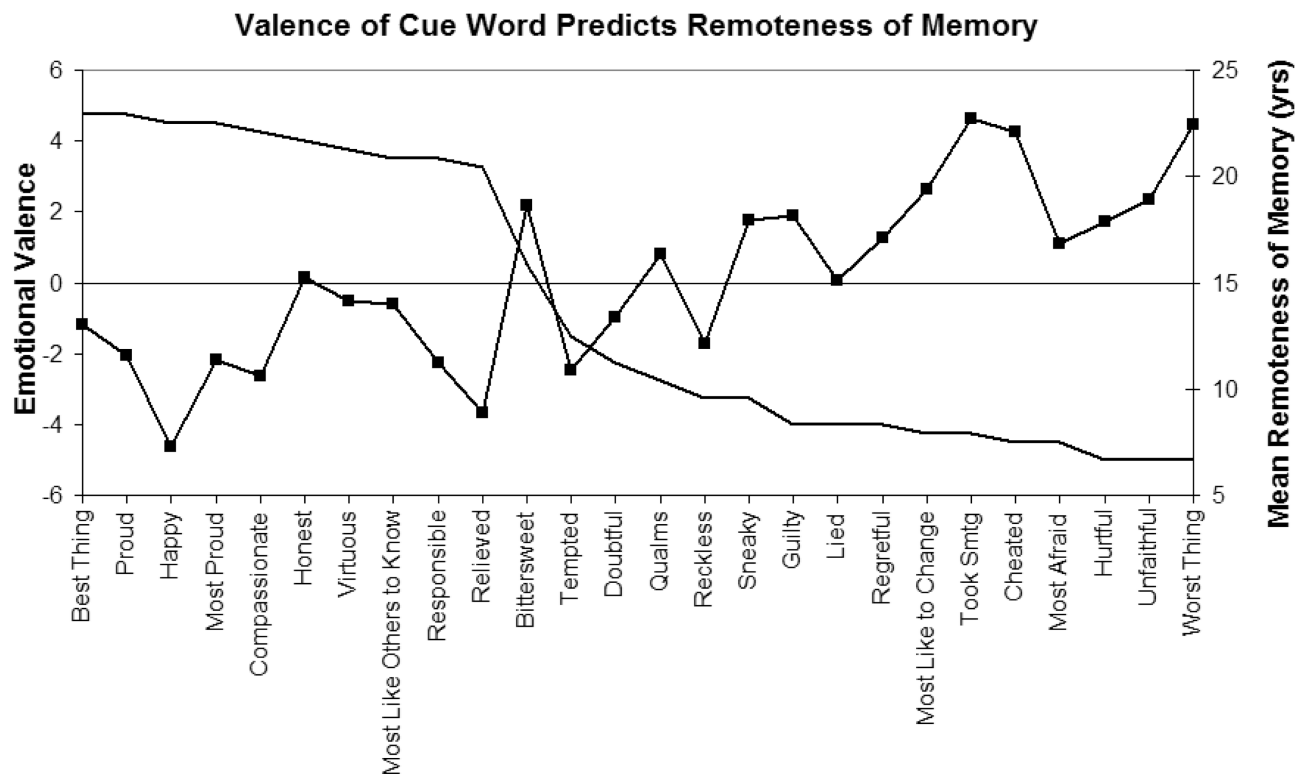
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(A)

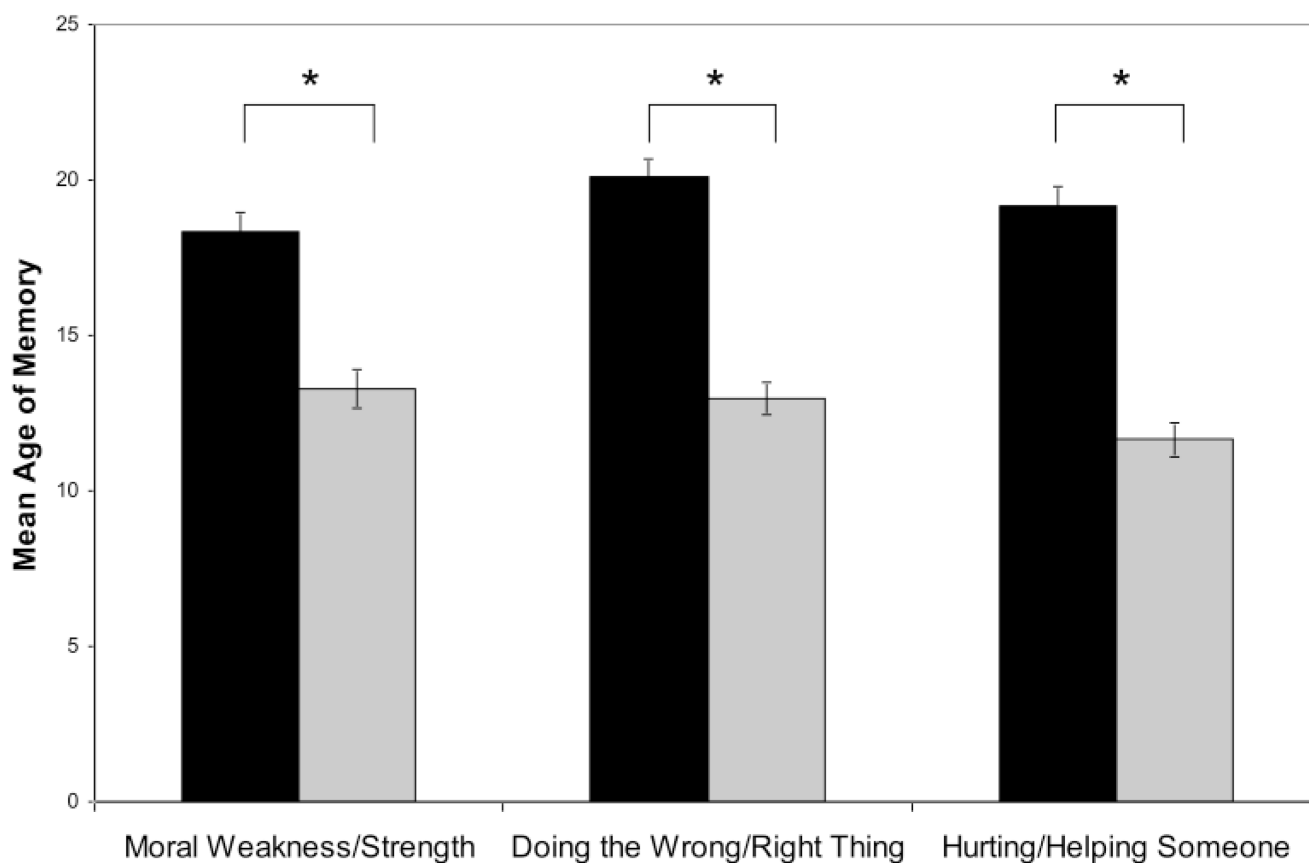


(B)

**Figure 1.**

Moral memories elicited by positively valenced cues are more recent. (A) Temporal distribution of memories as evoked by specific cue words (means). Positive and negative memories evoked by the itself valence-neutral cue “most memorable” are marked with arrows. (B) Emotional valence of the cue words is associated with the age of the memories they evoke ( $R=0.74$ ;  $p=0.004$ ). Remoteness of memory is shown with solid square symbols; valence is plotted without symbols.

### Valence of Rating Category versus Remoteness of Memory



**Figure 2.**

Memories with positive moral content are more recent. Black bars are negative moral content; gray bars are positive moral content (means and SEM). Contrasts between each of the oppositely valenced pairs of categories were significant ( $p < 0.001$ , for all three pairs). The contrast when comparing all three negative categories to all three positive categories was also significant ( $p < 0.001$ ).

**Table 1**

Demographic and background information on participants. Means and S.D. are given from the Wechsler Abbreviated Scale of Intelligence (WASI) (Wechsler, 1999), NEO Five-Factor Inventory (NEO-FFI) (Costa & McCrae, 1992), Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988) and the Ethical Position Questionnaire (EPQ) (Forsyth, 1980).

Age	48.9 $\pm$ 5.9 years (range: 40–60)
Gender	47 Male/ 53 Female
IQ (WASI)	110.5 $\pm$ 13.4 (range 77–138)
Ethnicity	50 Caucasian, 11 Black*, 10 Asian, 25 Hispanic, 4 other
Education	1 Elementary School, 9 High School, 41 Some College, 31 Bachelor's Degree, 13 Master's Degree, 5 Graduate Degree
Current Religion <sup>o</sup>	49 Christian, 3 Jewish, 3 Buddhist, 19 Other, 25 Atheist/Agnostic
Personality (NEO-FFI)	Neuroticism: 32 $\pm$ 5; Extraversion: 40 $\pm$ 4; Openness: 36 $\pm$ 4; Agreeableness: 37 $\pm$ 5; Conscientiousness: 41 $\pm$ 3
Mood (PANAS)	Positive Affect: 34 $\pm$ 7; Negative Affect: 14 $\pm$ 7
Ethics (EPQ)	Idealism: 3.7 $\pm$ 0.6; Relativism: 3.0 $\pm$ 0.7

<sup>o</sup> No participants were practicing Hindus or Muslims.

\* Black included participants of African and African-American descent.



**Table 2**

Cue words used to elicit moral memories. Three control cues (tired, exercised and funny) are not included in the table. Means (SD) are shown for valence ratings taken from the Affective Norms of English Words (ANEW) (Bradley & Lang, 1999), our own independent rating data, and the frequencies of each word in standard written English using the Kucera-Francis frequencies (Kucera & Francis, 1967). Words were chosen using the MRC Psycholinguistic Database (Coltheart, 1981) and supplemented with our own.

Cue	Number of Moral Memories	ANEW Valence Rating	Independent Valence Ratings	Kucera- Francis Word Frequency
Best Thing	4	*	8.80 (0.41)	*
Bittersweet	3		5.32 (1.06)	1
Cheated	66		1.23 (0.47)	<i>Cheat: 3</i>
Compassionate	42		8.39 (0.78)	2
Doubtful	7		3.07 (0.41)	22
Embarrassed**	1	3.03 (1.85)	1.64 (0.67)	8
Guilty	51	2.63 (1.98)	1.64 (0.67)	29
Happy	7	8.21 (1.82)	8.59 (0.47)	98
Honest	45	7.70 (1.43)	8.18 (0.67)	47
Hurtful to Someone	34	<i>Hurt: 1.90 (1.26)</i>	0.82 (0)	<i>Hurt: 37</i>
Lied	56	<i>Lie: 2.79 (1.92)</i>	1.64 (0.67)	<i>Lie: 59</i>
Memorable <sup>o</sup>	18	----	----	----
Most Afraid Others Will Find Out	20	* <i>Afraid: 2.00 (1.28)</i>	1.23 (0.47)	* <i>Afraid: 57</i>
Most Like Others to Know	5	*	7.77 (0.47)	*
Most Like to Change	7	*	1.43 (0.78)	*
Most Proud	5	*	8.59 (0.47)	*
Proud	5	8.03 (1.56)	8.80 (0.41)	50
Qualms	18		2.66 (1.23)	--
Reckless	10		2.25 (1.93)	9
Regretful	36	2.28 (1.42)	1.64 (0.67)	1
Relieved	9		7.57 (0.78)	<i>Relieve: 13</i>
Responsible	13		7.77 (1.42)	71
Sneaky	56		2.25 (0.78)	2
Tempted	39		3.68 (1.06)	<i>Tempt: 2</i>
Took Something	78		1.43 (0.78)	¥
Unfaithful	41	2.05 (1.55)	0.82 (0)	1
Virtuous	29	<i>Virtue: 6.22 (2.06)</i>	7.98 (0.41)	<i>Virtuous: 6</i> <i>Virtue: 30</i>
Worst Thing	29	*	0.82 (0)	*

\* Superlative cues were phrases and therefore do not have an ANEW rating.

\*\* Embarrassed was excluded from the analyses because it was an outlier.

° The word “memory” does have an ANEW (6.62 (1.50)) and K-F rating (76) but the testing cue ‘memorable’ was somewhat different from the other cues and not intended to evoke recollections based on the cue itself.

¥ Kucera-Francis Frequency for steal: 5.